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AUTHOR Huang, Zheng Sen
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ABSTRACT

This report gives the results of the Primary Assessment Program (PAP) in Aboriginal schools (Australia) for the 1987 school year. The purpose of PAP is to provide instructional feedback on student achievement in reading and mathematics and to provide indicators of performance for public reporting. All Aboriginal schools which had students in grade 5 to post-primary were asked to administer five reading tests and eight mathematics tests. Results indicate the following: (1) participation rate was low as less than a quarter of the target population of 2,500 students took the tests during 1987; (2) many schools either excluded all, or a substantial number of their students from testing as The Teachers Federation banned the testing program; (3) performance in practically all areas tested was considered low; and (4) when the test results for 1987 were compared to 1986, there was a significant drop in performance in 6 of 17 objectives tested in mathematics and a significant drop in performance in 6 of 10 reading tests. These results suggest that remedial strategies need to be developed and implemented at both the school and system level. This report also suggests that research into the causes for poor student performance be initiated. This report contains numerous data tables. (LP)

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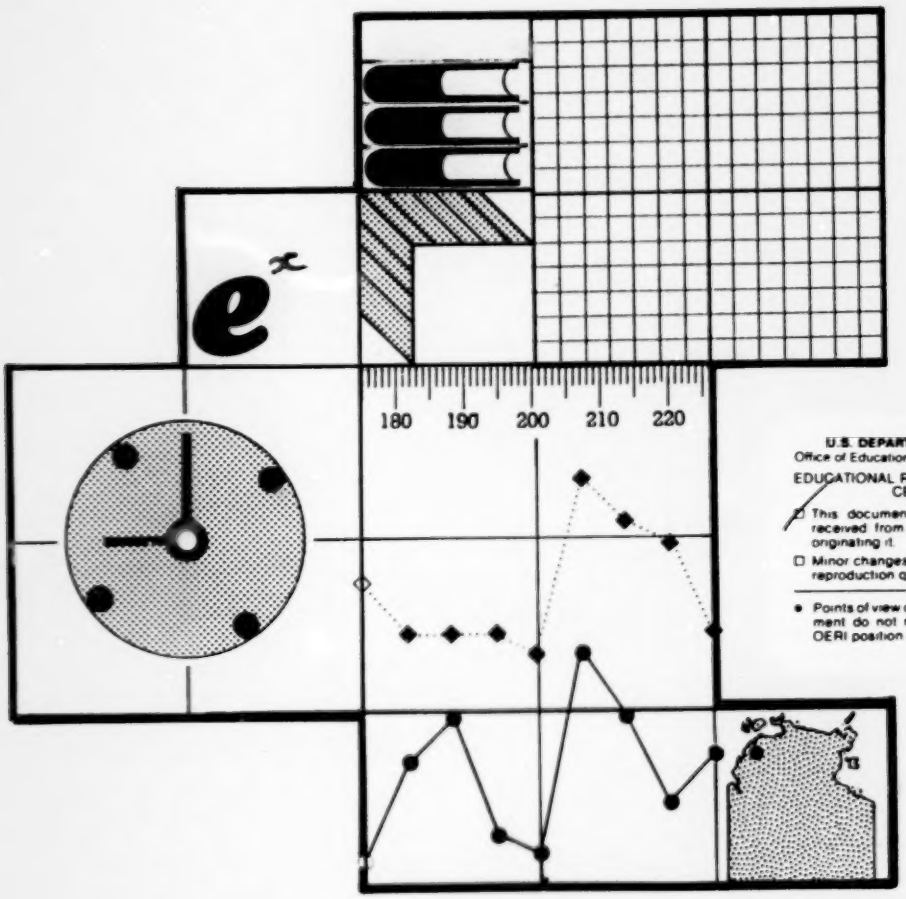

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REPORT ON STUDENT PERFORMANCE IN THE NORTHERN TERRITORY PRIMARY ASSESSMENT PROGRAM FOR ABORIGINAL SCHOOLS : 1987

Z S Huang
Principal Research Officer
Evaluation, Research and Accreditation Section
Curriculum and Assessment Branch
Northern Territory Department of Education

NORTHERN TERRITORY DEPARTMENT OF EDUCATION
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For further information please contact:

Curriculum & Assessment Branch
GPO Box 4821 Darwin NT 0801
Telephone: (089) 89 5611

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5. Report to the Board on areas of strength and weakness as identified by the assessment programs and make recommendations to the Board concerning appropriate actions which might arise therefrom.

6. Oversee the development and use of assessment materials beyond the core but within the Board Approved Curriculum as and when required by the Department.

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Principals and staff in Aboriginal schools for administering the tests, marking, and returning the students' answer papers.

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SECTION 1

TEST ADMINISTRATION

1.1 INTRODUCTION

The program which was introduced in 1986 was designed to provide schools with quality assessment materials for assessing achievement in the core objectives in English and mathematics. Reading and mathematics achievements are measured using paper and pencil tests; writing is assessed using a moderation process.

For system wide testing and public reporting of results, the program requires schools to administer a selection of tests in reading and mathematics and return students' answer sheets. Schools are issued with a printout of the results of their own students and the Territory results for comparison. This report gives the results of performance on the reading and mathematics tests conducted towards the end of 1987.

1.2 PURPOSE

The purpose of the program is two-fold:

(i) to provide instructional feedback on achievement in the core objectives in English and mathematics;

(ii) to provide at the system level some indicators of performance for public reporting.

1.3 COLLECTION OF DATA

All Aboriginal schools which had students in Years 5 to Post Primary were included. Using a stratified random sampling procedure, schools were assigned into two groups, each group broadly representative of the total population of Aboriginal schools.

Each school was asked to administer five reading tests and eight mathematics tests over a period of time during the second semester. Students from Years 5 to Post Primary working at or beyond Stage 5 of the English core objectives and Phase 2 of the mathematics core objectives were tested. Those operating much below these levels were excluded from the testing.

1.4 ADMINISTRATION OF THE TESTS

A set of guidelines was provided to teachers to ensure some uniformity in test administration. Students were allowed 2 to 3 minutes to look at the test. The teachers explained how students should write their answers for multiple-choice and open-ended items. Students were not allowed to talk with each other during the test and teachers were not to help students answer any test questions.

However, no time limits were specified: teachers were asked to use their own judgement in deciding whether enough time had been given. The timing and sequence of testing were also to be decided by the classroom teacher.

1.5 CONFIDENTIALITY OF INFORMATION

To protect the confidentiality of information collected, each school was given a school code known only to the project co-ordinator. Each student was also given a student number by the school. The student used the same number for all the tests that he or she took. The school code and student number were used to identify each answer sheet keyed into the computer for data processing and analysis.

SECTION 2

ANALYSIS OF PERFORMANCE ON THE MATHEMATICS TESTS

2.1 TABULATION OF RESULTS

Two sets of tables have been presented. Table 1A shows proportions (percentages) of students achieving at various cutoff scores, namely, 70%, 80%, 90% and 100% correct. The cutoff score for mastery of an objective was 80% correct.

Table 1B shows changes in performance between 1986 and 1987 for each objective tested. Changes in performance that were statistically significant are indicated with an asterisk (*) beside them.

2.2 PERFORMANCE BY CONTENT AREAS

Using the 80% cutoff score as the level for success, the mean percent successful for each strand was calculated. The strands covered by the tests were space, measurement and number.

(a) Space

The tests included in the testing program measured students' ability to identify 2-dimensional figures and use ordered pairs to locate positions in space. Performance in this area was markedly higher than those in the measurement and number strands.

Mean percent successful = 53.8

(b) Measurement

Five tests in measurement were included which required students to recall facts, identify symbols for units of length and mass, recall units used for length and mass, read and write time shown on a clockface.

The measurement tests proved to be very difficult for most students. Results showed that in each of the tests, a very high proportion was unsuccessful.

Mean percent successful = 19.4

(c) Number

There were eight tests on simple, routine computations, one test on place values and one on reading bar graphs.

The success rate was low on practically all areas.

Mean percent successful = 34.8

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2.3 SUMMARY OF RESULTS BY STRANDS

The following table provides a summary of the results in relation to the content areas.

STRAND	NUMBER OF OBJECTIVES	MEAN % SUCCESSFUL
Space	2	53.8
Measurement	5	19.4
Number	10	34.8

2.4 CHANGES IN PERFORMANCE BETWEEN 1986 AND 1987

The results from the 1986 and 1987 administrations were compared based on the tests common to both years. As Table 1B shows, most of the gains or losses between the two years were only marginal and not statistically significant. From Table 1B, the changes in performance between 1986 and 1987 may be summarised as follows:

CHANGES IN PERFORMANCE

	SIGNIFICANT IMPROVEMENT	SIGNIFICANT DECLINE	NO CHANGE
Number of Objectives	1	6	10

2.5 SIGNIFICANT CHANGES

The results indicated a significant improvement in 1987 in one of the areas in the space strand i.e. identify 2-D shapes.

However, there appeared to be a significant drop in performance in respect of six objectives, one in the space strand and the other five in the number strand.

In 1987, the results in respect of the following objectives appeared to be significantly worse:

(i) Use ordered pairs to locate position in space.

(ii) Subtract one digit number from a number less than 100.

(iii) Add, up to 3 digit numbers, with one or two decimal places.

(iv) Multiply a two-digit whole number by a single digit number, with or without regrouping.

(v) Divide a two-digit number by a one-digit number without regrouping, no remainder.

(vi) Identify units, tens and hundreds in numerals up to 1000.

TABLE 1A: PERCENTAGES AT DIFFERENT CUTOFFS: MATHEMATICS

YEAR 5 TO POST PRIMARY (1987)

No	Test Code	Objectives	No of Items	Proportions Obtaining 70%	80%	90%	100% Correct
		SPACE					
1.	S-A-1	Identify 2-D shapes (polygons)	10	74.9	65.8	52.5	27.4
2.	S-A-2A	Use ordered pairs to locate position in space	10	55.0	41.8	36.6	25.6
		MEASUREMENT					
3.	M-O-1	Recall some facts, e.g. 100 cm = 1 m 1 000 g = 1kg 24 h = 1 day 60 min = 1 hour	10	27.4	19.6	9.6	5.0
4.	M-O-2	Identify the following symbols: m, cm, L, g and kg	5	23.2	23.2	10.1	10.1
5.	M-O-3	Given an everyday object, identify the unit for its measure: m, cm, L, g or kg	5	17.9	17.9	9.6	9.6
6.	M-C-7A	Read time on a clockface.	5	15.0	15.0	5.0	5.0
7.	M-C-7B	Write time on a clockface	5	21.1	21.1	7.5	7.5
		NUMBER					
8.	N-A-3A	Subtract one digit number from a number less than 100	10	42.9	28.1	21.9	9.5
9.	N-B-1	Add, up to 3 digit numbers, with regrouping	10	56.8	50.2	44.1	27.3
10.	N-B-2	Subtract numbers, up to 3 digits, regrouping only in the units	10	30.0	25.9	18.6	13.6
11.	N-B-3	Add, up to 3 digit numbers, with one or two decimal places	10	39.2	30.0	18.8	8.3

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TABLE 1A: PERCENTAGES AT DIFFERENT CUTOFFS: MATHEMATICS

YEAR 5 TO POST PRIMARY (1987)

No	Test Code	Objectives	No of Items	Proportions Obtaining 70%	80%	90%	100% Correct
		NUMBER					
12.	N-B-4	Subtract 3 digit numbers with one or two decimal places, regrouping in the first column only	10	29.3	21.7	12.7	8.5
13.	N-C-1B	Recall basic facts in division, quotients to 10, single digit divisor and no remainder	10	56.1	52.9	47.8	32.0
14.	N-D-2	Multiply two-digit whole digit numbers by single digit numbers, with or without regrouping	10	21.5	17.4	13.4	8.9
15.	N-D-3A	Divide a two-digit number by a one-digit number without regrouping, no remainder	10	33.7	27.1	20.5	10.8
16.	N-E-2B	Identify units, tens and hundreds in numerals up to 1 000	5	55.3	55.3	19.7	19.7
17.	N-F-2	Read a bar graph	5	39.0	39.0	21.5	21.5

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TABLE 1B: CHANGES IN PERFORMANCE

MATHEMATICS, YEAR 5 TO POST PRIMARY

No	Test Code	Objectives	No of Items	Percentage Achieving Competence N	1986(%)	N	1987(%)	Change 1986-87
		SPACE						
1.	S-A-1	Identify 2-D shapes (polygons)	10	226	57.5	219	65.8	+8.3*
2.	S-A-2A	Use ordered pairs to locate position in space	10	320	70.6	273	41.8	-28.8*
		MEASUREMENT						
3.	M-O-1	Recall some facts, e.g. 100 cm = 1 m 1 000 g = 1kg 24 h = 1 day 60 min = 1 hour	10	209	19.1	219	19.6	+0.5
4.	M-O-2	Identify the following symbols: m, cm, L, g and kg	5	293	24.2	267	23.2	-1.0
5.	M-O-3	Given an everyday object, identify the unit for its measure: m, cm, L, g or kg	5	208	18.3	240	17.9	-0.4
6.	M-C-7A	Read time on a clockface.	5	284	13.4	220	15.0	+1.6
7.	M-C-7B	Write time on a clockface	5	307	16.0	213	21.1	+5.1
		NUMBER						
8.	N-A-3A	Subtract one digit number from a number less than 100	10	234	48.7	210	28.1	-20.6*
9.	N-B-1	Add, up to 3 digit numbers, with regrouping	10	234	45.3	227	50.2	-4.9
10.	N-B-2	Subtract numbers, up to 3 digits, regrouping only in the units	10	373	32.2	220	25.9	-6.3
11.	N-B-3	Add, up to 3 digit numbers, with one or two decimal places	10	281	52.7	240	30.0	-22.7*

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TABLE 1B: CHANGES IN PERFORMANCE

MATHEMATICS, YEAR 5 TO POST PRIMARY

No	Test Code	Objectives	No of Items	Percentage Achieving Competence N	1986(%)	N	1987(%)	Change 1986-87
		NUMBER						
12.	N-B-4	Subtract 3 digit numbers with one or two decimal places, regrouping in the first column only	10	203	26.6	212	21.7	-4.9
13.	N-C-1B	Recall basic facts in division, quotients to 10, single digit divisor and no remainder	10	281	59.4	278	52.9	-6.5
14.	N-D-2	Multiply two-digit whole digit numbers by single digit numbers, with or without regrouping	10	299	31.4	247	17.4	-14.0*
15.	N-D-3A	Divide a two-digit number by a one-digit number without regrouping, no remainder	10	223	39.9	166	27.1	-12.8*
16.	N-E-2B	Identify units, tens and hundreds in numerals up to 1 000	5	291	73.5	300	55.3	-18.2*
17.	N-F-2	Read a bar graph	5	193	43.5	223	39.0	-4.5

Note:

N = Number in sample
* = Statistically significant

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SECTION 3

ANALYSIS OF PERFORMANCE ON THE READING TESTS

3.1 TABULATION OF RESULTS

Two sets of tables have been presented. Table 2A shows proportions (percentages) obtaining various cutoff scores, viz. 60%, 70% 80% and 100% correct. The cutoff score for mastery was 70%.

Table 2B provides data on percentages achieving competence on each test for 1986 and 1987 respectively and changes in performance between the two years. Changes that were statistically significant are shown with an asterisk (*) beside them.

3.2 DISCUSSION OF THE RESULTS

Ten separate tests were administered using a sampling matrix in which each school had to administer two tests of reading comprehension, one test on dictionary skills and two tests of basic literacy.

Mean percent 'successful' (where success was 70% correct) was calculated for each of the three categories and reported below.

	CATEGORY	MEAN % SUCCESSFUL
(a)	Prose comprehension (C series)	23.0
(b)	Dictionary Skills (D series)	33.9
(c)	Basic Literacy (R series)	38.7

The results seem to suggest that most students had difficulty in all categories: comprehension of prose passages, dictionary (vocabulary) and basic literacy. Success rates were very low.

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3.3 CHANGES IN PERFORMANCE BETWEEN 1986 AND 1987

The changes in performance between 1986 and 1987 are depicted in Table 2B. Results for 1987 appeared to be somewhat worse than those of the previous year as in six of ten tests administered, the drop in performance was statistically significant. Changes in performance on the remaining four tests were marginal and did not appear to be statistically significant.

The changes in performance between the two years may be summarised as follows:

CHANGES IN PERFORMANCE

	CATEGORY	SIGNIFICANT IMPROVEMENT	SIGNIFICANT DECLINE	NO CHANGE
(a)	Prose comprehension (C series)	--	3	1
(b)	Dictionary Skills (D series)	--	2	--
(c)	Basic Literacy (R series)	--	1	3

TABLE 2A: PROPORTIONS AT DIFFERENT CUTOFFS : READING

YEAR FIVE TO POST PRIMARY (1987)

No	Test Code	Types	No of Items	Proportions Obtaining 60%	70%	80%	100% Correct
1.	C2	Formal	13	33.1	17.0	11.2	1.6
2.	C8	Prose Comprehension	10	37.3	26.3	20.1	6.2
3.	C9	Passages	12	28.8	18.6	13.3	2.2
4.	C11		12	33.6	29.9	19.6	3.3
5.	D1	Dictionary Skills	5	74.4	58.8	58.8	38.4
6.	D3		9	16.4	9.0	4.4	2.7
7.	R7	RDP Magazine Contents	8	42.6	25.4	10.5	3.4
8.	R9	RDP Addressed Envelope	10	63.9	53.3	40.8	12.7
9.	R11	RDP Street Map	10	51.7	38.8	24.9	7.2
10.	R16	RDP Excursion Timetable	10	51.5	37.1	24.2	1.5

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TABLE 2B: CHANGES IN PERFORMANCE

READING, YEAR FIVE TO POST PRIMARY

No	Test Code	Types	No of Items	Percentage Achieving Competence N	1986(%)	N	1987(%)	Change 1986-87
1.	C2	Formal	13	275	24.7	323	17.0	-7.7*
2.	C8	Prose Comprehension	10	227	41.4	209	26.3	-15.1*
3.	C9	Passages	12	275	34.6	323	18.6	-16.0*
4.	C11		12	243	32.9	214	29.9	-3.0
5.	D1	Dictionary Skills	5	218	69.3	211	58.8	-10.5*
6.	D3		9	298	23.2	299	9.0	-14.2*
7.	R7	RDP Magazine Contents	8	216	42.1	209	25.4	-16.7*
8.	R9	RDP Addressed Envelope	10	293	56.3	338	53.3	-3.0
9.	R11	RDP Street Map	10	232	33.2	209	38.8	+5.6
10.	R16	RDP Excursion Timetable	10	295	43.1	326	37.1	-6.0

Note:

N = Number in sample

* = Statistically significant

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SECTION 4

SUMMARY AND CONCLUSION

4.1 Less than a quarter of the target population of around 2500 students took the tests. Only a third of the total number of schools sent in their students' answer sheets for data analysis. The low participation rate of the last two years, 1986 and 1987, continued to be a disturbing factor.

4.2 Many schools either excluded all their students or a substantial number because in the teachers' opinion, their children were not operating at the level of the core objectives. In their dispute with the Department over teaching conditions, the Teachers Federation imposed a ban on the testing program. The effects of the ban on the program were not exactly known.

4.3 The tests were based on the core objectives for mathematics and reading for Year 5, and the benchmarks for success were 80% correct for the mathematics tests and 70% correct for reading. Results were reported in terms of percentages obtaining scores of 60%, 70%, 80% or 100% correct on each test. Schools were issued with the results of their own students in April 1988.

4.4 Performance on the mathematics tests indicated that an average of 54% were successful on the space tests, 19% were successful on the measurement tests and 35% passed the number tests. A high proportion of students could not perform successfully most of the tasks in the measurement area, such as recall of facts : 1000 g = 1 kg or 60 minutes = 1 hour, or read and write time correctly. Most students failed the addition, subtraction, multiplication and division tasks involving basic, routine calculations. There were no word problems.

When the results for 1987 were compared with those for 1986, there was a significant drop in performance in six of seventeen objectives tested in mathematics.

4.5 The results in the reading tests were also poor. An average of 23% were successful in the reading comprehension tests based on selected prose passages. An average of 34% passed the dictionary tests and 39% succeeded on tasks related to basic literacy. When results for 1987 and 1986 were compared, there was a significant drop in performance in six of ten reading tests administered in both years.

4.6 The majority of children had not mastered the main core objectives in reading comprehension such as identifying the main idea of a story or paragraph, arranging events in a sequence, giving the meaning of words in context or inferring from facts stated. The passages used were considered to be of appropriate length and difficulty for children in Year 5.

4.7 The tests in reading for different purposes measured skills related to functional literacy quite often demanded in everyday situations for performing various tasks. The tasks selected in this particular case were extracting information from the contents page of a magazine produced for Aboriginal children, reading a hypothetical street map, extracting information from an excursion timetable and making sense of what was written on the outside of an addressed envelope.

4.8 There were concerns that these tests were Western-oriented and thus culture-biased. It may be argued that there might be factors in the Aboriginal culture and learning styles which could affect the validity of these tests and hence reduce their reliability and usefulness as assessment instruments. However, no achievement test that has been produced commercially is absolutely culture-free. It is perhaps true that cultures which are more test-oriented seem to possess an advantage. The tests were written by people who had taught in Aboriginal schools and a lot of care was taken to strip off elements in the tests that appeared to be culture-biased. For instance, the passages for comprehension came from Aboriginal folklore and the materials testing basic literacy were written for Aboriginal children.

Although the results should be regarded as tentative, it cannot be denied that performance in practically all areas was low. Furthermore, as the benchmarks were set at the level of the core objectives for Year 5, the results should give cause for concern. The data collected in the last two years may provide a basis for remedial strategies to be developed at both the school and system levels. Research into the causes for poor performance seems vital.

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